



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/825,547	04/14/2004	Joe E. Stout	10012068-4	9111

7590 03/27/2006
HEWLETT-PACKARD COMPANY
Intellectual Property Administration
P. O. Box 272400
Fort Collins, CO 80527-2400

EXAMINER	
PHAM, HAI CHI	
ART UNIT	PAPER NUMBER
2861	

DATE MAILED: 03/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/825,547

Applicant(s)

STOUT ET AL.

Examiner

Hai C. Pham

Art Unit

2861

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 22-24, 26-30, 34-37 and 43-45 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 22-24, 26, 27 and 43 is/are allowed.
- 6) ☒ Claim(s) 28-30, 34-37, 44 and 45 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 28, 30, 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blair (U.S. 6,520,617) in view of Takayama et al. (JP 6-246922).

Blair discloses a drop emitting apparatus comprising a resistor (heater resistor 56, Fig. 1) on a substrate surface (substrate 54), a first polymer layer (ink barrier 12) formed over the substrate surface and surrounding the resistor to define a firing chamber (the ink barrier 12 is formed of a photopolymer material such as dry film, and surrounds the resistor 56 to form the ink chamber 19), a second polymer layer (orifice plate 13) formed over the first polymer layer and defining a nozzle over the firing chamber (the orifice plate 13 comprises of a polymer material in which the orifices 21 are formed) (col. 2, lines 27-45).

Blair fails to teach the top coating layer defining a countersunk bore corresponding to an opening of the nozzle from which the fluid is ejected.

Takayama et al. discloses an ink jet recording head comprising a circuit pattern (2) including a heating element (counter electrode 3) formed on an insulating layer (1), an ink-proof layer (7) formed over the circuit pattern, a barrier layer (8) and a top coat

Art Unit: 2861

layer (cover coat layer 9) defining a countersunk bore corresponding to an opening of the nozzle (10) from which the ink is ejected (Fig. 2c).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to incorporate the top coating layer into the device of Blair to form a countersunk bore corresponding to the opening of the nozzle as taught by Takayama et al. The motivation for doing so would have been to allow the ink droplet to cleanly detach from the nozzle.

Blair further teaches the first polymer layer including a dry film (col. 1, lines 42-45).

3. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Blair in view of Takayama et al., as applied to claim 28 above, and further in view of Mrvos et al. (U.S. 6,409,312).

Blair, as modified by Takayama et al., discloses all the basic limitations of the claimed invention except for one the first and second polymer layers comprising SU8.

However, it is old and well known in the art that the photoimagable polymer such as SU8 developed by IBM has been preferably used in the ink barrier as a hard polymer layer surrounding the heater resistor as evidenced by Mrvos et al., which discloses an ink jet printer and a process of fabricating the ink jet print head, comprising a resistor (heater resistor 22) on a substrate surface (semiconductor substrate 14), a first polymer layer (first photo-imaged polymer layer 44) formed over the substrate surface and surrounding the resistor, a second polymer layer (second photo-imaged polymer layer

52) formed over the first polymer layer and defining a nozzle (50), and wherein the first and second polymer layers (44 and 52) are SU8 layers (col. 5, line 66 to col. 6, line 10).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide the ink barrier layer and/or the nozzle plate of Blair with the SU8 material as taught by Mrvos et al. The motivation for doing so would have been to provide a hard polymer layer forming the firing chamber resistant to a high environmental temperature.

4. Claims 35-37 and 44-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blair in view of Takayama et al., as applied to claims 28 and 34 above, and further in view of Radke et al. (U.S. 6,054,011).

Blair, as modified by Takayama et al., discloses all the basic limitations of the claimed invention except for the third layer formed between the first and second polymer layers, and the primer layer formed between the substrate and the first polymer layer.

Radke et al. discloses an ink jet print head comprising a heating element (not shown) (col. 1, lines 20-36), a cover layer supported on the substrate surface, the cover layer defining a firing chamber (32) formed about the heating element and defining a nozzle (17) over the firing chamber, wherein the cover layer includes a first layer (barrier layer 24), a second layer (orifice plate 14) and a third layer (adhesion promoter layer 20) disposed between the barrier layer and the nozzle plate, a top-coat layer (16), and a primer layer (intermediate layer 27) supported by the substrate surface (substrate 29),

Art Unit: 2861

wherein at least one outer edge of at least one other of the cover layers is offset from the outer edge of the primer layer to expose a surface of the primer layer (Fig. 1).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to incorporate the third layer and the primer layer in the modified device of Blair as taught by Radke et al. The motivation for doing so would have been to enhance the adhesion between the plural layers forming the ink jet print head as well as to protect the substrate from heat.

Allowable Subject Matter

5. Claims 22-24, 26-27 and 43 are allowed.

Response to Arguments

6. Applicant's arguments with respect to claims 28-30, 34-37 and 44-45 have been considered but are moot in view of the new grounds of rejection.

Contact Information

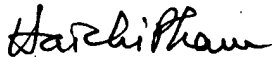
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai C. Pham whose telephone number is (571) 272-2260. The examiner can normally be reached on M-F 8:30AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen D. Meier can be reached on (571) 272-2149. The fax phone

Art Unit: 2861

number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



HAI PHAM
PRIMARY EXAMINER

March 22, 2006